

REMARKS/ARGUMENTS

35 USC § 102(b)

Claims 1-16 were rejected under 35 USC § 102(b) as being anticipated by Danihel (U.S. Pat. No. 4,598,547). The applicant respectfully disagrees, especially in view of the amendments and arguments provided herein.

At the outset, the applicant points out that Danihel's device is a wave energy harvester in a propulsion system of a floating vessel where *hydrofoils are used to produce a forward motion*, which in turn is used to *minimize drag of the float* through the water as the vessel moves through the water. Danihel expressly teaches that:

"...When the wave energy transducer 10 is employed as a *power generator in a vessel propulsion system*, it is quite desirable for the underside of the float 23 to be formed with a hydrofoil system 64. By using a hydrofoil system 64, *drag on the float 23 is minimized as the vessel is propelled through the water*. The float mounting arm 22 is permanently fixed to the hemispherical upper portion of the float 23. (emphasis added)...", column 4, lines 48-53, and

"...The disposition of the hydrofoil wings 75 upwardly and to the right with the float 28 moving upwardly *acts against the resisting force of the water* to tend to propel the foils 75 forwardly to the right. This *reduces the resistance of movement of the system through the water...*" (emphasis added)...", column 5, lines 15-20.

In contrast, it should be appreciated that applicant's wave energy harvester relies on the exact opposite. More specifically, the lift generated by the forward motion of a wave will ***increase the drag*** on the device in the direction of the wave travel. Similarly, the downward force generated by the backward motion of a wave will once again ***increase the drag*** on the device opposite the direction of the wave travel. Thus, the overall amplitude of the device is increased while retaining the device in substantially the same position. This difference is clearly recited in the claims:

As amended, **claim 1** expressly requires that "...the *amplifier element is configured* such that lift generated by forward motion of the wave *increases drag on the harvester...*", which is

neither taught nor inherently present in Danihel's device. Indeed, and as discussed above, the hydrofoil system of Danihel minimizes drag.

Moreover, amended claim 1 also specifically recites an "...amplifier element [that] has a shape and is arranged on the harvester such that the *amplifier element is effective* to translate forward velocity of water of a *cresting wave* relative to the element into an *additional upward force* of the entire wave energy harvester as compared to an upward force without the amplifier element...", which is inconsistent with the device of Danihel as the hydrofoil system provides a forward but not an upward force. Dependent claims 2, and 4-5 carry the same limitations and the same arguments therefore apply. Consequently, claims 1-6 as amended should not be deemed anticipated by, or obvious over the '547 patent.

Similarly, amended **claim 6** expressly requires that the hydrofoil element is arranged on the harvester such that "...the *bi-directional force is directed upwards as the wave approaches a peak* and *directed downwards as the wave approaches a trough*..." In contrast, Danihel's device provides forward and backward forces, but not an upward force as presently claimed. As above, dependent claims 7-10 carry the same limitations and the same arguments therefore apply. Thus, claims 6-10 should not be deemed anticipated by, or obvious over the '547 patent.

Likewise, amended **claim 11** expressly requires that the "... hydrofoil is positioned such that *lift generated by a forward motion of the wave increases drag on the device* in direction of the wave travel." Again, such arrangement is not only inconsistent, but contrary to the device of Danihel. Dependent claims 12-14 carry the same limitations and the same arguments therefore apply. Consequently, claims 11-14 as amended should not be deemed anticipated by, or obvious over the '547 patent.

With respect to amended **claim 15** it is noted that claim 15 specifically requires that the "...*amplifier element* is configured such that lift generated by the forward water motion of the wave *increases drag on the harvester*..." Once again, such claimed configuration is contrary to the teachings of Danihel, and claims 15-16 as amended should not be deemed anticipated by, or obvious over the '547 patent.

35 USC § 103(a)

Claim 17 was rejected under 35 USC § 103(a) as being obvious over Danihel (U.S. Pat. No. 4,598,547) in view of Heck (U.S. Pat. No. 4,447,740). The applicant respectfully disagrees.

As claim 17 depends on amended claim 15, all of the defects and arguments as pointed out above apply and are not reiterated here. Heck fails to remedy these defects. While Heck does teach use of a turbine for energy production, such turbine is directly coupled to a buoyant element that fails to include an amplifier element as presently taught. Thus, claim 17 should not be deemed obvious over the cited art.

Claims 18-20 were rejected under 35 USC § 103(a) as being obvious over Danihel (U.S. Pat. No. 4,598,547) in view of Houser (U.S. Pat. No. 5,411,377). The applicant respectfully disagrees.

Amended **claim 18** is dependent on amended claim 15. All of the defects and arguments as pointed out above apply and are not reiterated here. Houser fails to remedy these defects, and the rejection of claim 18 should therefore be withdrawn. Moreover, it should be noted that claim 18 as amended requires the energy harvester to have neutral buoyancy *during normal operation*. Such requirement is inconsistent with the operating principle of Danihel and would render the device of Danihel inoperable for its intended purpose.

Moreover, the applicant respectfully notes that Houser does not teach a neutrally buoyant device as the office appears to argue. On the contrary, Houser teaches that the device operates with a buoyancy vessel that rides the crest and the trough of the ocean waves (see *e.g.*, col. 3, lines 7-9). Clearly, such operation is entirely inconsistent with a neutrally buoyant wave energy harvester as presently claimed (see also Figures 2A and 2B of instant application). Therefore, the combination of Danihel and Houser is improper. For at least these reasons and amendments, the rejection should no longer be maintained.


Similarly, and with respect to **claim 19** (and dependent claims 20-21) it is noted that the claim requires a harvester having neutral buoyancy during normal operation. As noted above, a modification of Danihel's device to render the device neutrally buoyant would render Danihel's device inoperable for the intended purpose. Moreover, it is once more pointed out that Houser's

wave energy harvester is not a neutrally buoyant device. Indeed, Houser's device is fixed on the seabed and connects to a platform above the wave crest, and uses a buoyancy vessel that rides the crest and the trough of the ocean waves. Clearly, such device is inconsistent with the presently claimed subject matter. Therefore, claim 19-21 should not be deemed obvious over the cited art.

In view of the present amendments and arguments, the applicant believes that all claims are now in condition for allowance. Therefore, the applicant respectfully requests that a timely Notice of Allowance be issued in this case.

Respectfully submitted,
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